

(19) Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) EP 1 229 582 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
19.10.2005 Bulletin 2005/42

(51) Int Cl.7: H01L 21/78, H01L 21/762

(43) Date of publication A2:  
07.08.2002 Bulletin 2002/32

(21) Application number: 02002259.6

(22) Date of filing: 30.01.2002

(84) Designated Contracting States:  
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE TR  
Designated Extension States:  
AL LT LV MK RO SI

(30) Priority: 31.01.2001 JP 2001023847

(71) Applicant: CANON KABUSHIKI KAISHA  
Ohta-ku, Tokyo (JP)

(72) Inventors:  
• Yonehara, Takao  
Ohta-ku, Tokyo (JP)  
• Sakaguchi, Kiyofumi  
Ohta-ku, Tokyo (JP)

(74) Representative: TBK-Patent  
Bavariaring 4-6  
80336 München (DE)

(54) Thin-film semiconductor device and method of manufacturing the same

(57) A thin-film semiconductor device with a reduced influence on a device formation layer in separation and a method of manufacturing the device are provided. The manufacturing method includes the step of preparing a member having a semiconductor film with a

semiconductor element and/or semiconductor integrated circuit on a separation layer, the separation step of separating the member at the separation layer by a pressure of a fluid, and the chip forming step of, after the separation step, forming the semiconductor film into chips.

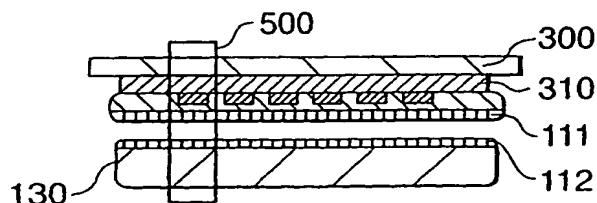
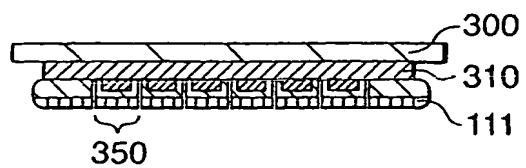


FIG. 1C

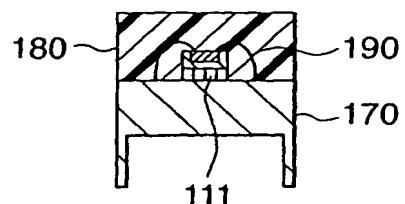
**FIG. 1D**



**FIG. 1E**



**FIG. 1F**





European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 02 00 2259

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 00/63965 A (SILICON GENESIS CORPORATION; KANG, SIEN, G; MALIK, IGOR, J) 26 October 2000 (2000-10-26) * page 1, line 18 - page 2, line 28; figures 1,6,6a,17a-17c * * page 6, line 18 - page 9, line 11 * * page 12, line 10 - page 12, line 25 * -----	1-9,11	H01L21/78 H01L21/762
X	FR 2 784 794 A (COMMISSARIAT A L'ENERGIE ATOMIQUE) 21 April 2000 (2000-04-21) * page 12, line 12 - page 13, line 11; figures 4-7 *	10,12	
X	US 6 010 579 A (HENLEY ET AL) 4 January 2000 (2000-01-04) * column 4, line 1 - column 6, line 51; figures 1-3,10-16 *	1-9,11	
X	US 6 171 965 B1 (KANG SIEN G ET AL) 9 January 2001 (2001-01-09) * the whole document *	1-9,11	
A	US 5 071 792 A (VANVONNO ET AL) 10 December 1991 (1991-12-10) * abstract; figures 3,15-17 *	1,10-12	H01L
The present search report has been drawn up for all claims			
3	Place of search The Hague	Date of completion of the search 25 August 2005	Examiner Hedouin, M
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 00 2259

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-08-2005

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 0063965	A	26-10-2000	US	6171965 B1	09-01-2001
			US	6204151 B1	20-03-2001
			US	6391219 B1	21-05-2002
			AU	4481100 A	02-11-2000
			WO	0063965 A1	26-10-2000
			US	2003008477 A1	09-01-2003
			US	2001016402 A1	23-08-2001
<hr/>					
FR 2784794	A	21-04-2000	FR	2784794 A1	21-04-2000
			WO	0024054 A1	27-04-2000
<hr/>					
US 6010579	A	04-01-2000	AU	7685198 A	08-12-1998
			CA	2290104 A1	19-11-1998
			CN	1255237 A ,C	31-05-2000
			EP	0995227 A1	26-04-2000
			JP	2001525991 T	11-12-2001
			US	2002055266 A1	09-05-2002
			US	6048411 A	11-04-2000
			US	6159824 A	12-12-2000
			US	5985742 A	16-11-1999
			US	5994207 A	30-11-1999
			US	6146979 A	14-11-2000
			US	6013563 A	11-01-2000
			US	6159825 A	12-12-2000
			US	6155909 A	05-12-2000
			US	6245161 B1	12-06-2001
			US	6162705 A	19-12-2000
			US	6290804 B1	18-09-2001
			US	2002081823 A1	27-06-2002
			WO	9852216 A1	19-11-1998
			US	2003113983 A1	19-06-2003
			US	6391740 B1	21-05-2002
			US	6013567 A	11-01-2000
			US	6511899 B1	28-01-2003
			US	6291313 B1	18-09-2001
			US	6413837 B1	02-07-2002
			US	6528391 B1	04-03-2003
			US	6187110 B1	13-02-2001
			US	6033974 A	07-03-2000
			US	6294814 B1	25-09-2001
			US	6284631 B1	04-09-2001
			US	2002106870 A1	08-08-2002
			US	6558802 B1	06-05-2003
			US	6335264 B1	01-01-2002
			US	6458672 B1	01-10-2002
			US	2001026997 A1	04-10-2001

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 00 2259

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
 The members are as contained in the European Patent Office EDP file on  
 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-08-2005

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6010579	A			US 2002115264 A1 US 2002056519 A1 US 2005070071 A1	22-08-2002 16-05-2002 31-03-2005
US 6171965	B1	09-01-2001		AU 4481100 A WO 0063965 A1	02-11-2000 26-10-2000
US 5071792	A	10-12-1991		EP 0537306 A1 WO 9209098 A2 US 5185292 A	21-04-1993 29-05-1992 09-02-1993